



Durham Research Online

Deposited in DRO:

11 June 2009

Version of attached file:

Accepted Version

Peer-review status of attached file:

Peer-reviewed

Citation for published item:

Bambra, C. and Norman, P. (2006) 'What is the association between sickness absence, mortality and morbidity?', *Health and place*, 12 (4). pp. 728-733.

Further information on publisher's website:

<http://dx.doi.org/10.1016/j.healthplace.2005.02.008>

Publisher's copyright statement:

Additional information:

Use policy

The full-text may be used and/or reproduced, and given to third parties in any format or medium, without prior permission or charge, for personal research or study, educational, or not-for-profit purposes provided that:

- a full bibliographic reference is made to the original source
- a [link](#) is made to the metadata record in DRO
- the full-text is not changed in any way

The full-text must not be sold in any format or medium without the formal permission of the copyright holders.

Please consult the [full DRO policy](#) for further details.

Durham Research Online

Deposited in DRO:

11 June 2009

Peer-review status:

Peer-reviewed

Publication status of attached file:

Accepted for publication

Citation for published item:

Bambra, C. and Norman, P. (2006) 'What is the association between sickness absence, mortality and morbidity?', *Health and place.*, 12 (4). pp. 728-733.

Further information on publisher's website:

<http://dx.doi.org/10.1016/j.healthplace.2005.02.008>

Use policy

The full-text may be used and/or reproduced, and given to third parties in any format or medium, without prior permission or charge, for personal research or study, educational, or not-for-profit purposes provided that :

- a full bibliographic reference is made to the original source
- a link is made to the metadata record in DRO
- the full-text is not changed in any way

The full-text must not be sold in any format or medium without the formal permission of the copyright holders.

Please consult the full [DRO policy](#) for further details.

Durham University Library, Stockton Road, Durham DH1 3LY, United Kingdom
Tel : +44 (0)191 334 2975 | Fax : +44 (0)191 334 2971
<http://dro.dur.ac.uk>

What is the association between sickness absence, mortality and morbidity?

Abstract

This paper examines the area level relationships in England and Wales between sickness absence ('Incapacity Benefit'), mortality and morbidity. It uses a random sample of Incapacity Benefit claims, and population counts of mortality and Census morbidity for local government districts. Although, there is little correspondence between sickness absence claims by specific cause and mortality, all cause sickness absence has a strong relationship with all cause mortality (male $r = 0.74$, $p=0.00$; female $r = 0.64$, $p=0.00$) and it also has a very strong relationship with the Census measures of morbidity: LLTI (male $r = 0.98$, $p=0.00$; female $r = 0.97$, $p=0.00$) and 'not good health' (male $r = 0.99$, $p=0.00$; female $r = 0.96$, $p=0.00$). Incapacity Benefit claims by all causes has the potential to provide an ongoing measure of area level health in England and Wales.

103 words

Keywords: Incapacity Benefit, sickness absence, LLTI, Census, mortality, morbidity.

Introduction

The high numbers of people who are out of work and claiming social security benefits on the grounds of long-term sickness absence has become an increasingly salient policy concern across Europe (OECD 2003). This is especially so in England and Wales where the number of long-term sickness absence claims have increased rapidly over the past three decades from 0.5 million in 1975 to 2.4 million in 2002 (Blondal and Pearson, 1995; McCormick, 2000; DWP, 2003a). 8.4 percent of the working age population currently claim social security benefits on the grounds of ill health compared to 2.6 percent for unemployment and 2.3 percent for lone parenthood (DWP, 2003a). These claims also account for the largest chunk of social security expenditure, around £7 billion per annum (McCormick, 2000) or 1.5% of Gross Domestic Product (GDP) (OECD, 2003).

In England and Wales, people who are absent from work due to long-term sickness may be entitled to claim Incapacity Benefit (IB). This is a social security cash benefit paid to people who are assessed by their General Practitioner (GP) doctor or a Benefits Agency doctor as being incapable of work due to illness and who meet certain contribution conditions (see DWP, 2004). IB is similar in remit to the long-term sickness and disability insurance schemes of other Western countries such as the USA's Social Security Disability Insurance and the disability pensions of Germany and Sweden (OECD, 2003). There are three rates of IB which are receivable up to pensionable age: a lower rate paid for the first 28 weeks of sickness to people who are not entitled to employer funded Statutory Sick Pay (SSP); and a higher rate paid for weeks 29 to 52 after entitlement to SSP or lower rate IB has ceased. The third, a long-term IB rate, applies to people who have been sick for more than a year; this category comprises the largest number of claimants (McCormick, 2000). The focus in this paper is on long-term IB.

The substantial increase in the number and costs of IB claimants in England and Wales, as well as rising numbers of claims based on more manageable medical conditions, such as back pain or depression (DWP 2003a; DWP, 2003b), has initiated a debate about whether IB claims are actually related to health status, morbidity, and even mortality. One point of view

argues that the increases in claims are more related to changing patterns of employment rather than an actual increase in the prevalence of ill health or incapacity (Disney and Webb, 1991; Armstrong, 1998; Fieldhouse and Hollywood, 1999; Beatty and Fothergill, 2002; DWP, 2003b). On the other hand, IB claims are medically certified by GPs and there is some individual level research evidence from recent cohort studies to suggest that medically certified sickness absence does reflect actual morbidity and mortality (Marmot, Feeney et al., 1995; Kivimaki, Head et al., 2003; Vahtera, Pentti et al., 2004).

Our study engages with this debate as it provides a population level examination of the relationship between claims for medically certified long-term sickness absence (IB) and other indicators of morbidity and mortality in England and Wales. Specifically, we were interested in how the number of IB claims related to disease specific and all cause standardised mortality rates and all cause standardised illness rates derived from the 2001 Census health questions.

Methods

Indirectly Standardised Illness Rates (SIRs) and Standardised Mortality Rates (SMRs) were calculated for the working age population (16-64 males, 16-59 females) for the 376 local government areas of local authority districts or unitary authorities (these will both be referred to as LAs) in England and Wales. The working age, economically active populations of the LA districts in this study vary considerably, ranging from 7,906 to 304,418 for males (average 44,909; standard deviation 29,578) and from 6,894 to 294,182 for females (average 42,257; standard deviation 28,678). Two LA districts, City of London and Isles of Scilly, have been excluded because their populations are so small that results may be unreliable. Standard rates and LA populations at risk were calculated using the Office for National Statistics (ONS) mid-year estimates (MYEs) for 2001.

IB SIRs were calculated from event counts of long-term rate (over 12 months) Incapacity Benefit (IB) by LA district. These were derived from a 5% sample of claimants in 2002 supplied by the Department for Work and Pensions (DWP). The IB data were obtained by all reasons for claim (which we will term 'all causes') and by various conditions. These conditions

were diagnosed by each claimant's GP and we obtained data for six broad International Classification of Diseases (ICD) codes (10th revision): F00-F99 mental and behavioural disorders; G00-G99 diseases of the nervous systems; I00-I99 diseases of the circulatory system; M00-M99 diseases of the musculoskeletal system and connective tissue; R00-R99 symptoms, signs and abnormal clinical and laboratory findings not classified elsewhere; and S00-T98 injury, poisoning and certain other consequences of external causes.

Event counts of all cause mortality and various broad causes of death by ICD(10) code (equivalent to the diagnosed causes of IB claim listed above) were derived from the Vital Statistics table VS3 for the calendar year 2001 disseminated by ONS. Event counts of self-reported limiting long-term illness (LLTI) and 'Not Good' health (NGH) for SIRs were obtained from Standard Table ST016 of the 2001 Census Statistics (ONS, 2003).

National mortality rates by six broad ICD(10) causes of death were compared with IB rates by six equivalent ICD(10) conditions. SIRs of IB by these specific causes were then correlated (Pearson's r) with SMRs of death by the same causes. Finally, all cause SMRs were correlated (Pearson's r) with all cause IB rates, and the Census derived SIRs (LLTI and NGH).

Results

Figures 1a and 1b show the national rates of IB claims and mortality by six broad ICD(10) causes. For all six causes of IB and mortality, they show that male rates exceed those of females, but this is largely explained by differences in the retirement age of men (65) and women (60) in England and Wales. The figures also show that there are quite different patterns in the national rates of IB and mortality as 'mental and behavioural disorders' have the highest rates of IB but the mortality rate of these conditions is relatively low. Similarly, there are relatively high rates of IB claims relating to 'diseases of the musculoskeletal system', but again, mortality rates by this cause are low. Conversely, IB claims relating to diseases of the circulatory system are low, but mortality rates by this cause are relatively high,

particularly for males. Overall, in terms of national rates, there is little correspondence between IB and mortality rates by specific cause.

Our results also suggest that SIRs of IB by a certain cause are unrelated to SMRs of death by the same cause. Table 1 shows the results of correlations between IB claims and SMRs by the six broad ICD causes. Generally the relationships are not particularly strong especially for G00-G99 diseases of the nervous system (male $r = -0.01$, $p=0.84$; female $r = 0.02$, $p=0.66$) and M00-M99 diseases of the musculoskeletal system (male $r = 0.07$, $p=0.20$; female $r = 0.11$, $p=0.05$). Overall, the correlations are stronger for males than females. This could again be due to the different age structure of the male and female working age populations or, in the case of the physical conditions, perhaps due to the more manual nature of traditional male employment. Despite weak overall relationships, less common IB claims, such as on the basis of I00-I99 circulatory disease (figure 1a), are shown to be a good predictor of mortality by that cause (male $r = 0.53$, $p=0.00$; female $r = 0.38$, $p=0.00$).

The overall lack of relationship between the specific IB and SMR causes is perhaps also due to the fact that some conditions, such as F00-F99 mental and behavioural disorders or M00-M99 diseases of the musculoskeletal system are common causes of IB claims (see figure 1a) but are relatively rare mortality events (see figure 1b). This is perhaps because the cause of death is not necessarily due to the same precursor condition. It is possible that IB claims by a specific cause have a stronger relationship with a different cause of death. For example, IB claims due to F00-F99 mental and behavioural disorders relate more strongly to death by X60-X84 intentional self-harm (male $r = 0.40$, $p=0.00$; female $r = 0.19$, $p=0.00$).

Although the results suggest that IB claims by specific causes are not a good indicator of area level mortality by specific causes, all cause IB claims provide a good indicator of more common specific and all cause mortality. Table 2 shows the results of correlations between all cause IB and the six broad ICD causes of death. The relationships here are only slightly less weak than for each specific cause of IB. Table 2 also shows the results of correlations between all cause IB and other common specific causes of death (no equivalent IB claims)

such as diseases of the respiratory system or malignant neoplasms. These correlations are much stronger suggesting that IB is a good area level indicator of broad cause of death (and the different relationship with V01-V89 land traffic accidents is understandable). The relationship between all cause IB and all cause mortality is very strong (male $r = 0.74$, $p=0.00$; female $r = 0.64$, $p=0.00$). Indeed, the strength of relationship is comparable to that of the more widely used Census SIR measure of LLTI (male $r = 0.72$, $p=0.00$; female $r = 0.68$, $p=0.00$) as well as the measure NGH (male $r = 0.76$, $p=0.00$; female $r = 0.69$, $p=0.00$), newly introduced in the 2001 Census. Unsurprisingly then, all cause IB has been found to have a very strong relationship with answers to the Census self-assessed health questions LLTI (male $r = 0.98$, $p=0.00$; female $r = 0.97$, $p=0.00$) and NGH (male $r = 0.99$, $p=0.00$; female $r = 0.96$, $p=0.00$).

Discussion

This study has provided the first area level analysis of the relationship between long-term sickness absence (IB) and mortality in England and Wales. Although it has shown that at area level specific reasons for long-term sickness (IB) claims are not a good indicator of the same specific causes of mortality, it has shown that all cause long-term sickness absence is a good predictor of common causes of death and all cause mortality. The study has also shown that similar findings of recent cohort studies (Marmot, Feeney et al., 1995; Kivimaki, Head et al., 2003; Vahtera, Pentti et al., 2004) on the relationship between sickness absence and mortality are also applicable at the area level.

The results of the study also add to the discussion over the rise in claims of long-term sickness absence (IB) in England and Wales over the past thirty years. Generally, the growth in long-term IB claims has been attributed to changing employment patterns. It has been argued that IB is an attractive alternative to unemployment benefit particularly in many regions where jobs in heavy industry have disappeared (McCormick, 2000). The results of this study however suggest that the rise in IB claims may also have a basis in the changing nature of health complaints. Perhaps, there is an increasing willingness to claim on the basis of stress-related F00-F99 mental and behavioural disorders, or the health hangover of heavy

industry is becoming apparent in the number of claims made on the basis of M00-M99 diseases of the musculoskeletal system.

Furthermore, the study has shown that all cause IB has a similar relationship to all cause mortality as the Census derived health indicators of LLTI and NGH. IB data have previously been overlooked as a source of health information by the wider public health community. This is perhaps surprising given its relationship to morbidity and mortality and the fact that all cause IB has the advantage of being available as an ongoing measure of health, whereas the more commonly used Census measures are only available decennially. Perhaps more research is needed into IB as a source of health information before it can be used alongside Census measures as part of local health profiles.

This study has identified relationships at the area level but we cannot, of course, assume that it is the same people being diagnosed with a condition and claiming IB for a particular reason and dying of a particular cause. To do so would be to risk the ecological fallacy since relationships identified at area level cannot be assumed to apply at individual level (Fieldhouse and Tye, 1996). The Census, Vital Statistics and Incapacity Benefit data were collected over different, but overlapping time periods. The Census is a snapshot for the end of April 2001 with the health measures reported depending on a person's interpretation of their own health and of the meaning of each question at that time. The Vital Statistics are collected at the end of the calendar year so many of the deaths recorded for 2001 will be people present at the Census. Similarly, a long-term rate (over 12 months) Incapacity Benefit data download for May 2002 should almost exclusively contain persons who had reported on their health in the 2001 Census and it is likely that, at the time of the Census, most claimants will have been suffering from the condition with which they are diagnosed. We must also recognise that the IB data are a 5% sample, so potentially subject to error.

Acknowledgements

The authors gratefully acknowledge the Department for Work and Pensions (DWP) for making available the Incapacity Benefit data. The Census and Vital Statistics data for England and Wales are Crown Copyright and have been provided by the Office for National Statistics.

References

- Armstrong, D., 1998. Hidden male unemployment in Northern Ireland. *Regional Studies* 33(6): 499-511.
- Beatty, C. and Fothergill, S., 2002. "Hidden unemployment among men: a case study." *Regional Studies* 36(8): 811-823.
- Blondal, S. and Pearson, M., 1995. Unemployment and other non-employment benefits. *Oxford Review of Economic Policy* 11(1): 136-69.
- Department for Work and Pensions., 2003a. Incapacity benefit and severe disablement allowance: Quarterly Summary Statistics.
http://www.dwp.gov.uk/asd/asd1/ib_sda/ib_sda_quarterly_feb03.xls.
- Department for Work and Pensions., 2003a. Rehabilitation - the public health perspective. Sheffield, DWP.
- Department for Work and Pensions., 2004. Incapacity Benefit.
<http://www.jobcentreplus.gov.uk/cms.asp?Page=/Home/Customers/WorkingAgeBenefits/492>
- Disney, R. and Webb, S., 1991. Why are there so many long-term sick in Britain? *Economics Journal* 101: 252-62.
- Fieldhouse, E. and Hollywood, E., 1999. Life after mining: hidden unemployment and changing patterns of economic activity amongst miners in England and Wales 1981-1991. *Work, Employment and Society* 13(3): 483-502.
- Fieldhouse, E. and Tye, R., 1996. Deprived people or deprived places? Exploring the ecological fallacy in studies of deprivation with the Samples of Anonymised Records. *Environment and Planning A* 28(237-259).
- Kivimaki, M., Head, J., Ferrie J., Shipley, M., Vahtera, J., Marmot, M. 2003. Sickness absence as a global measure of health: evidence from mortality in the Whitehall II prospective cohort study. *British Medical Journal* 327(16 August): 364-70.
- Marmot, M., Feeney, A., Shipley, M., North, F., Syme, S. 1995. Sickness absence as a measure of health status and functioning: from the UK Whitehall II study. *Journal of Epidemiology and Community Health* 49(2): 124-130.

McCormick, J. 2000. On the sick: incapacity and inclusion. Edinburgh, Scottish Council Foundation.

Office for National Statistics (2003) National Report and results for local authorities and wards. http://www.statistics.gov.uk/census2001/cn_87.asp

Organisation for Economic Cooperation and Development. 2003. Transforming disability into ability: policies to promote work and income security for disabled people. Paris, OECD.

Vahtera, J., Pentti, J., Kivimaki, M., 2004. Sickness absence as a predictor of mortality among male and female employees. Journal of Epidemiology and Community Health 58: 321-326.

Figure 1a: Incapacity benefit: national rates by cause (ICD10)

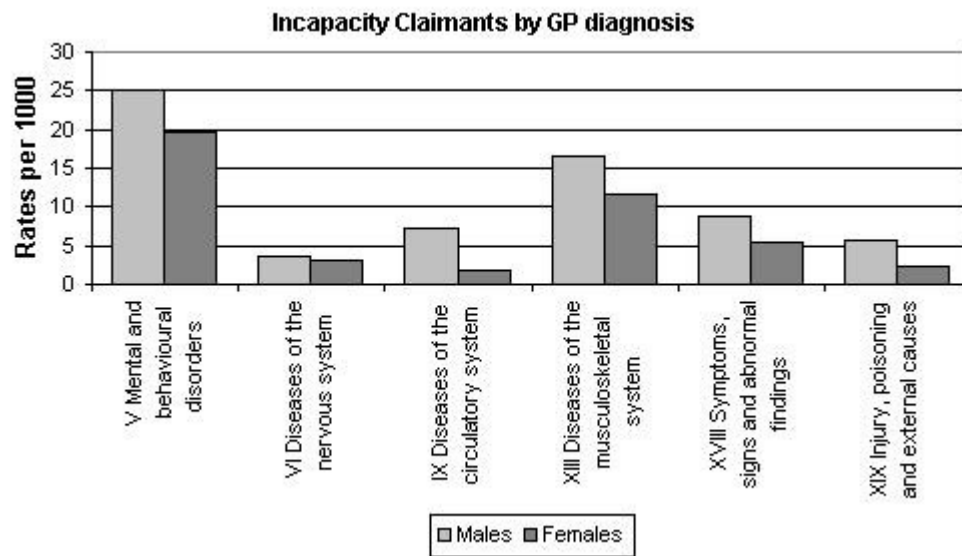


Figure 1b: Mortality: national rates by cause (ICD10)

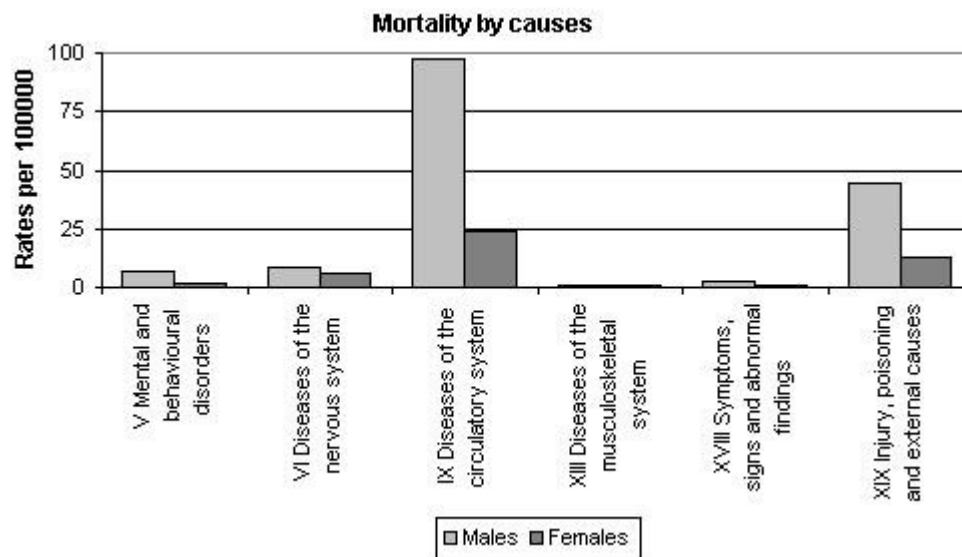


Table 1: Correlations between Incapacity Benefit claims and standardised mortality rates by various ICD causes.

Standardised Mortality Rates ^a		Correlations with equivalent causes of IB ^b			
ICD(10) code	Description	Male		Female	
		<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
F00-F99 (V)	Mental and Behavioural Disorders	0.33	0.00	0.15	0.00
G00-G99 (VI)	Diseases of the Nervous System	-0.01	0.84	0.02	0.66
I00-I99 (IX)	Diseases of the Circulatory System	0.53	0.00	0.38	0.00
M00-M99 (XIII)	Diseases of the Musculoskeletal System and connective tissue	0.07	0.20	0.11	0.05
R00-R99 (XVIII)	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	0.16	0.00	0.01	0.83
S00-T98 (XIX)	Injury, poisoning and certain other consequences of external causes	0.32	0.00	0.11	0.05

^a VS3 mortality

^b DWP

Table 2: Correlations between all cause Incapacity Benefit and standardised mortality rates by various ICD causes.

Standardised Mortality Rates ^a		Correlations with all causes of IB claim ^b			
ICD 10 code (& Chapter)	Description	Male		Female	
		<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
F00-F99 (V)	Mental and Behavioural Disorders	0.27	0.00	0.18	0.00
G00-G99 (VI)	Diseases of the Nervous System	0.09	0.07	0.04	0.50
I00-I99 (IX)	Diseases of the Circulatory System	0.68	0.00	0.59	0.00
M00-M99 (XIII)	Diseases of the Musculoskeletal System and connective tissue	0.12	0.03	0.13	0.01
R00-R99 (XVIII)	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	0.21	0.00	0.07	0.15
S00-T98 (XIX)	Injury, poisoning and certain other consequences of external causes	0.38	0.00	0.19	0.00
C00-C97 (in II)	Malignant neoplasms	0.54	0.00	0.35	0.00
C33-C34 (in II)	Malignant neoplasm of trachea bronchus and lung	0.47	0.00	0.40	0.00
J00-J99 (X)	Diseases of the respiratory system	0.47	0.00	0.43	0.00
J40-J44 (in X)	Bronchitis emphysema and other chronic obstructive pulmonary disease	0.42	0.00	0.45	0.00
X60-X84 (in XX)	Intentional self-harm	0.38	0.00	0.17	0.02
V01-V89 (in XX)	Land transport accidents	-0.18	0.00	-0.12	0.00
A00-R99 & V01-Y89	All cause	0.74	0.00	0.64	0.00

^a VS3 mortality

^b DWP